Post Covid-19 and Technology Integration in Secondary Schools in Delta State, Nigeria

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ABSTRACT

This study investigated post-Covid-19 and technology integration in secondary schools in Delta State. Five research questions and two null hypotheses guided the study. The study adopted the descriptive method of *ex-post facto* research design premised on the positivists research paradigm. The population of the study comprised all students and teachers of public secondary schools in Delta State, Nigeria. The sample size for the study comprises 384 students and 370 teachers. The sampling technique used for the study is the proportional stratified sampling. Checklist and two sets of questionnaires are the instruments used to collect data for this study. The face and content validities of the questionnaire are determined by the researcher's supervisor and two other Professors in the Department of Educational Management and Foundations. Cronbach alpha reliability index is used to determine the internal consistency of the items in the instrument. The data obtained were analysed using descriptive and inferential statistics. The findings of the study revealed amongst others that both teachers and students in Delta State secondary schools have a positive attitude towards technology integration, despite the limited availability of ICT facilities and development and training programmes. The mean score of teachers was higher than that of students. The study recommends that the Delta State Government should increase the availability of ICT facilities and development and training programmes in secondary schools. The study contributes to knowledge by providing evidence that both teachers and students in Delta State secondary schools in the post-COVID-19 era have a positive attitude towards technology integration, despite the dearth of internet infrastructure in schools.

Keywords: Covid-19; Technology Integration; Secondary Schools; Delta State, Nigeria

INTRODUCTION

The world has experienced several natural and human-induced phenomena in recent times. One of such phenomena is the emergence of the Coronavirus disease, otherwise known as Covid-19. In December, 2019, the World Health Organisation announced the discovery of the new Coronavirus in Wuhan, China. Within a short time, it spread quickly throughout the world, leaving behind devastating impact on virtually all sectors of the economy around the world.

The World Health Organisation (WHO) declared Covid-19 a pandemic in March 2020. It was referred to as a pandemic because of the widespread occurrence over the world, in excess of what might normally be expected in a country or a geographical region (called endemic). Like earlier pandemics, the human population was greatly threatened by the spread of the novel coronavirus. As at 9th January 2022, a total of 306,091,673 cases have been recorded around the world, with a total of 5,502,854 deaths (Worldometer, 2022). Some of the earlier pandemics were Antomie plague (165AD), plague of Justinian (541-542), the Black death (1346-1353), cholera pandemic (1852-1860; 1910-1911), Flu pandemic (1889-1890), Asian flu (1956-1958), flu pandemic (1968).

One area of the sector that appears to have been more affected was the education sector. The United Nations

Educational, Scientific and Cultural Organization (UNESCO, 2020) reported that more than 1.5 billion students in 188 countries were affected by the global pandemic. In a bid to reduce the spread of the virus and save lives, government of different countries, with the recommendation of the World Health Organisation, implemented a lockdown protocol. This protocol meant that no one is allowed to come out of their homes for a period of time. Only health officials and other essential service workers were allowed to move around. As the lockdown continued, students were meant to stay at home doing virtually little or nothing related to their academics, teaching and learning suffered; poverty was on the increase.

After several months of staying at home, with the education sector almost grounded, some schools decided to migrate from physical classrooms to virtual classrooms. According to Duraku and Hoxha (2020), the use of technology was considered the most appropriate alternative to keep educational systems functional in many parts of the world during the period. Several online platforms were opened to link students and teachers from wherever they were. The move was successful in the developed countries, due partly to their technological advancement and human capital development. Before now, these countries were already practicing online instruction. Students and teachers in these schools were already computer literate and could find their way around the internet.

The story is however, different in the developing nations such as Nigeria. Some tertiary institutions and private secondary schools in big cities were able to fairly successfully migrate to online learning. The majority of the public secondary schools both tertiary institutions and secondary schools could not migrate due, in part to lack of infrastructural facilities and poor technological know-how among students, teachers and parents. According to Obiakpor and Adeniran (2020), while several private schools have begun to initiate distance learning programs, and taking advantage of the myriad of ICT-learning opportunities provided by the international community, the government limited by funds and persistent deficiencies in planning, was yet to announce any official plans for providing distance learning opportunities, especially for public secondary schools.

In Delta State, for more than six months, no public secondary school carried out academic activities both offline and online (Egede, 2021). Six months without learning is enough to cause students to lose interest in school. This calls for concerns among all stakeholders of education. The fact that students stayed at home for the greater part of the year 2020 revealed the sad story of the education system of Nigeria, particularly Delta State. It shows that the state has not done enough in terms of technology integration in secondary schools.

More than one year after schools reopened, observations have shown that nothing has been done to ensure that what happened in 2020 does not repeat itself again. Most schools in the state still lack computer facilities and most teachers and students have no adequate competencies and skills of using the computer system. Although, most teachers are positively disposed to the application of ICT, they are faced with limitations such as lack of ICT and internet facilities.

Research Questions

The following research questions guided the study:

1. To what extent are ICT facilities available for technology integration in secondary schools in Delta State in the post Covid-19 era?
2. What development and training programmes that were put in place by the Delta State Government to assist both teachers and students to quickly adopt teaching and learning technologies?
3. To what extent are teachers willing to accept technology integration in secondary schools in Delta State in the post Covid-19 era?
4. To what extent are secondary school students willing to accept technology integration in secondary schools in Delta State in the post Covid-19 era?

5. What lessons did the teachers learn from the era of Covid-19?

Hypotheses

The following hypotheses were tested at 0.05 level of significance:

1. There is no significant difference in the attitude of teachers and students towards technology integration in Delta State secondary schools in the post Covid-19 era
2. There is no significant difference between teachers and students' willingness to accept technology integration in Delta State secondary schools in the post Covid-19 era

THEORETICAL FRAMEWORK OF THE STUDY

The study is anchored on two theories; the theory of Diffusion of Innovations by Rogers (2003) and Technology Acceptance Model (TAM) by Davis (1989). The theory of Diffusion of Innovations by Rogers explained the process by which an innovation is conveyed to members of a social system through certain channels and over time. The process starts with "knowledge" of the first channel that represents characteristics of the decision-making unit by the ICT users in order to integrate the technology and it ends with "confirmation" by the users to accept the technology and integrate it accordingly.

The technology acceptance model (TAM) introduced by Davis (1989) is one of the first acceptance models to take account of the psychological factors that affect the acceptance of technology. The TAM describes the causal linkages of perceived usefulness (PU), perceived ease of use (PEU), attitudes toward computer use (ATCU), external factors (EV), and behavioral intention to use ICT based on the theory of reasoned action (TRA, Fishbein and Ajzen, 1976). Its goal is to "provide a general and capable theory of explaining user behavior across a broad range of end-user computing technologies and user populations." It also "provides an explanation of the determinants of computer acceptance (Davis et al., 1989: 985).

According to the TAM, two central beliefs have a direct effect on attitudes towards ICT: 'perceived usefulness' and 'perceived ease of use'. The subjective probability that employing a given application system will improve [a person's] job performance within an organizational setting is characterized as perceived usefulness (Davis et al., 1989). Perceived ease of use refers to the extent to which a person believes that using a certain computer system or application is free of effort how user-friendly it is for the user. External variables such as gender, subjective norms (Venkatesh & Davis, 2000), prior use of technological systems, and professional development are thought to influence both perceived usefulness and perceived ease of use or application. Furthermore, in this model, the behavioral intention to use a given computer system or technology is hypothesized to be influenced directly and significantly by attitudes about computer use, as well as an indirect effect of PU.

The TAM has already been applied in many domains and target populations, with most corresponding studies showing that it can be used to predict the behavioral intention to use ICT. There are, however, some differences between teachers and employees in more business-related environments. In this context, Petko (2012) pointed out that educators (teachers) have greater autonomy in their choice of technology than general users, whose technology use is often embedded in business contexts, where the level of peer competition is higher than in schools. Accordingly, and because other researchers had investigated additional factors that moderate technology use by teachers, Venkatesh and Morris (2000) extended the original version of the TAM and added gender, experience and subjective norm to the model.

TAM theory was created to assist the understanding of the worth and efficacy of a given system by measuring the effectiveness or success of a technology. It is also considered as one of the most influential theories in contemporary information systems research. However, the theory has evolved with more specific

variables explaining how a user can accept a technology over the years.

The above theories are relevant to the study because they include various factors directly associated with the core aim of the study that explains how government leadership, availability of ICT facilities, teachers development and attitude of teachers and students will affect technology integration. Intension to integrate ICT by teachers is the main variable that supports the key elements in the above theories such as ease-of-use, functionality, flexibility, accessibility and integration. In addition, the intention of teachers to use the technology is strongly influenced by their ICT knowledge, and attitude as well as their perceived ease of use.

REVIEW OF RELATED LITERATURE

It is necessary that suitable ICT assistance in the form of infrastructure and tools, as well as hardware and software support, are required to offer effective online and blended learning (Ali, 2020). However, according to the World Bank (2020), even the best-performing training institutions may not be well-equipped to provide online learning to all students on such a wide scale. The reason for this is because technical advancements frequently outrun decision makers' abilities to stay up, especially when cost and infrastructural support are taken into account (World Bank, 2020). Accordingly, Adebisi, Agboola, and Okereke (2020) stated that establishing the necessary infrastructure for online learning in Nigeria remains a serious difficulty.

According to a survey conducted in Nigeria, access to digital devices is restricted in both primary and secondary schools as there are no computers and or bandwidth provided by government, NGOs or individuals (Igbokwe, Okeke-James, Anyanwu & EliChukwu, 2020; Azubuike et al, 2021). Tertiary institutions, except very few, are not spared from the problem of access to ICT infrastructure. According to reports, students in tertiary institutions do not have access to Android phones in order to participate in online learning (Okeji & Alex-Nmecha, 2021). Access to ICT infrastructure is a fundamental problem for the digitalisation of teaching and learning at postsecondary institutions (Oyediran et al, 2020; Azubuike, 2021; Ojo Joseph et al, 2021). Kerres (2020) and Mseleku (2020) confirmed that not all colleges have e-learning communication tools that allow students to participate in online learning.

One way to improve the rate of integration is via professional development (Brinkerhoff, 2006). Professional development provides teachers with opportunities to explore new technologies and develop new skills, learn about and practice technology integration and provide teachers with the support and direction they require to gain the confidence they need to put those abilities into practice (Brinkerhoff, 2006; Oncu, 2008; Overlaugh and Lu, 2008).

Three main concepts of ICTs in teacher education curriculum were outlined by the International Society for Technology in Education (ISTE) in 2003. These include incorporating ICTs into the overall teacher education program, introducing ICTs in context, and exposing students to innovative technology-supported learning environments. According to Kirschner and Davis (2003), good practice for both pre-service and in-service programme for teacher training in ICTs include the following; that teacher become sufficiently competent to make personal use of ICTs, competent to make use of ICT as mind's tool; become master of a range of educational paradigms that make use of ICT, sufficiently competent to make use of ICT as a tool for teaching; and understand the policy dimension of the use of ICT for teaching and learning. As a result, instructors and students who lack digital literacy or expertise risk falling behind in their online studies (Adedoyin & Soykan, 2020).

As important as the concept of ICT is to humanity in the modern society, its usage and acceptance by everybody is not guaranteed. As a result, technology acceptance and usage have sparked the development of a number of ideas. Teachers must accept and be prepared to use ICT in the classroom, and their professional development must be tailored toward this goal. In general, an E-readiness—measuring instrument is used to

assess consumers' ability to use ICT for their own profit in any firm. Teachers' preparedness can be defined as their perceptions of their ability to integrate ICT into their classroom instruction when applied to education. Because it is a paradigm change from the old approach of teaching, a teacher should be mentally and physically prepared to utilize ICT to teach in the real classroom.

Rea, Dewi, and Diah (2019) discovered that skill in using ICT, belief, training in ICT skills, and availability of ICT (Soft wares and hard wares) equipment were the main influencing factors in teachers' preparedness to utilize ICT in the classroom. Palmavathi (2015) investigated student-teachers' readiness to use technology in the classroom and discovered that they were enthusiastic about using ICT to teach. He also employed a Likert-type questionnaire to examine the influence of topic area on student teachers' use of ICT in teaching.

Chaka & Govender (2017) found that students of three schools from the north-central part of Nigeria expressed enthusiasm in implementing mobile learning. According to Utulu and Alonge (2012), instructors and students in their university, use mobile devices mostly for communication, documenting outcomes, accessing online resources, and exchanging knowledge. Adedoja et al. (2013) investigated students' attitudes on the usage of mobile phones for lesson delivery, and found that they were more interested and motivated to learn, and that attitude is influenced by perceived benefit, implying that students' perceived benefit stimulated their willingness to learn using these e-facilities. Olelewe & Agomuo (2016), using a quasi-experimental design investigated the effects of blended learning and face-to-face learning on computer education student achievement. Their finding revealed that students' achievement improved dramatically when they used a blended learning strategy because of the ubiquitous, collaborative and social interactions.

According to Walsham and Sahay (2007), in developing countries, the use of ICT helps in the development and growth of a national economy. With the rapid development of ICT, countries globally have taken the opportunity to apply technology in raising the living standards of their people. The rapid changes in ICT products have influenced the development of technology used in the educational field. Ghavifekr and Ibrahim (2015) stated that the integration of ICT in Malaysian classrooms needs serious consideration in order to increase the competency of those enrolled in the country's education system. The development of ICT has changed the teaching and learning process from traditional methods to a technology-based approach. Since the advent of internet technology, there has been a change in the pattern of life of communities and society around the world in education, economics, politics, and socially. AlJeraisy, Mohammad, Fayyoumi, and Alrashideh (2015) stated that sharing and collaborating with regard to information can be equally extended to the teaching and learning process. According to Nuurrianti (2016), this is because the use of the internet continues to grow from time to time. Kop (2011) also explained that contributions in educational technology are in terms of the dissemination of learning content without borders and students are able to surf the Internet which helps to enhance their understanding of a subject or topic being taught.

METHODS

The study adopted the descriptive method of *ex-post facto* research design. The population of the study comprised 268,985 students and 14,745 teachers of public secondary schools in Delta State, Nigeria. The sample size comprised 384 students and 370 teachers. The choice of the sample size was based on the recommendation of Gill, Johnson, and Clark (2010), who, in their study on sample size determination, suggested that a sample size of 384 is adequate for a survey when the population size is between 250,000 and 499,999, and a sample size of 370 is adequate when the population size is between 10,000 and 24,999 at a 95% confidence level. The sampling technique used for the study was proportional stratified sampling. Proportional stratified sampling is a probability sampling method where different strata in a population are

identified, and the number of elements drawn from each stratum is proportional to the relative number of elements in that stratum. This sampling technique was chosen because the Local Government Areas included in the study did not have an equal number of students and teachers. The researcher estimated the percentage of the sample size in relation to the overall population size, resulting in 0.143% for students and 2.51% for teachers. The researcher used simple random sampling technique to select from the group who met the general requirements of the study. The instruments that were used to collect data in this study are two set of questionnaires, one for teachers and one for students as well as a checklist. Each questionnaire contains two parts. Each of the parts are further divided into different sections; Section A contains the demographic data of the students such as gender. Section B contains Development and Training Programmes put in place by the Delta State Government to Assist both Teachers and Students to Quickly Adopt Teaching and Learning Technologies; section C contains Attitude of Students Towards Technology Integration; while section D contains Students Willingness to Accept Technology Integration in Secondary Schools. The second instrument contains six sections; section A contains the demographic data of the teachers such as gender; section B contains checklist on ICT Facilities Available for technology Integration in Secondary Schools; section C contains Development and Training Programmes put in place by the Delta State Government to Assist both Teachers and Students to Quickly Adopt Teaching and Learning Technologies; section D contains Attitude of Teachers Towards Technology Integration; section E contains Teachers Willingness to Accept Technology Integration in Secondary Schools; while section F contains Lessons Learnt from the Era of Covid-19. The questionnaire items were structured on a 4-point scale, ranging from 1 for strongly disagree to 4 for strongly agree. The students and teachers were required to respond to the items in the questionnaire based on their candid opinion.

The face and content validities of the questionnaire were determined by the researcher's supervisor and two other Professors in the Department of Educational Management and Foundations. They examined the questionnaire in terms of content and suitability of the items to the objective of the study. Their suggestions for improvement were effected to make the instrument to be considered more valid. In order to establish the reliability of the instrument, the questionnaire was administered to 10 teachers and 10 students in a particular school, that were not part of the study. The data were analysed using Cronbach alpha reliability coefficient to determine its measures of internal consistency. It yielded a coefficient that was used to estimate the reliability coefficient of the instrument. The coefficients include Development and Training Programmes put in place by the Delta State Government to Assist both Teachers and Students to Quickly Adopt Teaching and Learning Technologies = 0.95; Attitude of Students Towards Technology Integration = 0.99; Students Willingness to Accept Technology Integration in Secondary Schools = 0.96; ICT Facilities Available for technology Integration in Secondary Schools = 0.74; Development and Training Programmes put in place by the Delta State Government to Assist both Teachers and Students to Quickly Adopt Teaching and Learning Technologies = 0.84; Attitude of Teachers Towards Technology Integration = 0.91; Teachers Willingness to Accept Technology Integration in Secondary Schools = 0.96; and Lessons Learnt from the Era of Covid-19 = 0.98.

The questionnaire was administered directly to the respondents by the researchers with the assistance of three research assistants. The research assistants were previously coached on how to administer the instrument. The researcher visited the schools to meet with the teachers and students. Prior to administering the questionnaire, the researcher sought and obtained permission from the principals of the schools. The researcher explained the salient areas of the questionnaire to enhance the participants' understanding of the items. The completed questionnaires were retrieved immediately after administration. The data obtained were analysed using descriptive and inferential statistics. Frequency, percentage, mean, and standard deviation were utilized to answer the research questions. Additionally, independent samples t-tests were employed to test the hypotheses at a significance level of 0.05. The Statistical Package for Social Sciences (SPSS) version 26 was utilized for the data analysis.

RESULTS

Research Question 1: To what extent are ICT facilities available for technology integration in secondary schools in Delta State in the post Covid-19 era?

Table 1: Percentage analysis of available ICT facilities for technology integration in secondary schools in Delta State in the post Covid-19 era

S/N	ICT Facilities	Available		Not Available	
		Number	Percentage	Number	Percentage
1	Television	228	61.62%	142	38.38%
2	Laptop	275	74.32%	95	25.68%
3	Tablets	0	0.00%	370	100.00%
4	Smart phones	96	25.95%	274	74.05%
5	DVD Players	129	34.86%	499	134.86%
6	Internet facilities	0	0.00%	370	100.00%
7	Video Machine	0	0.00%	370	100.00%
8	Opaque Projector	0	0.00%	370	100.00%
9	Digital Cameras	0	0.00%	370	100.00%
10	Fixed Telephone Set	0	0.00%	370	100.00%
11	Electronic Mail	0	0.00%	370	100.00%
12	Scanner	25	6.76%	345	93.24%
13	Radio	0	0.00%	370	100.00%
14	Radio Set	0	0.00%	370	100.00%
15	Cassette Player	258	69.73%	112	30.27%
16	CD-ROMS	218	58.92%	152	41.08%
17	Smart Board	0	0.00%	370	100.00%
18	Digital Multimedia	0	0.00%	370	100.00%
19	Photocopying Machine	57	15.41%	313	84.59%
20	Projector	0	0.00%	370	100.00%
21	Projector Slide	0	0.00%	370	100.00%
22	Bibliographic Control Tools	0	0.00%	370	100.00%
23	Duplicating Machine	0	0.00%	370	100.00%
24	Electronic Notice Boards	0	0.00%	370	100.00%
25	Prezi	0	0.00%	370	100.00%
26	Dropbox	0	0.00%	370	100.00%
27	Virtual Reality (VR)	0	0.00%	370	100.00%
28	VoiceThread	0	0.00%	370	100.00%
29	BoomWriter	0	0.00%	370	100.00%
30	Quizlet	0	0.00%	370	100.00%
31	Distributed Ledger Technology (DLT)	0	0.00%	370	100.00%
32	Animoto	0	0.00%	370	100.00%
33	Video-Assisted Learning	0	0.00%	370	100.00%

34	Augmented Reality (AR)	0	0.00%	370	100.00%
35	Educreations	0	0.00%	370	100.00%
36	Socrative	0	0.00%	370	100.00%
37	Artificial Intelligence (AI)	0	0.00%	370	100.00%
38	Visme	0	0.00%	370	100.00%
39	Pixton	0	0.00%	370	100.00%
40	StoryJumper	0	0.00%	370	100.00%
41	GDrive	0	0.00%	370	100.00%
42	Scratch	0	0.00%	370	100.00%
43	Padlet	0	0.00%	370	100.00%
44	Schoology	0	0.00%	370	100.00%
45	Gamification	0	0.00%	370	100.00%
46	Storybird	0	0.00%	370	100.00%
47	Evernote	0	0.00%	370	100.00%
48	Haiku Deck	0	0.00%	370	100.00%
49	Glogster	0	0.00%	370	100.00%
50	Edmodo	0	0.00%	370	100.00%
51	Learning Management System	0	0.00%	370	100.00%
52	Google Classroom	0	0.00%	370	100.00%
53	Flipsnack	0	0.00%	370	100.00%
54	Piktochart	0	0.00%	370	100.00%

Table 1 shows the percentage analysis of available ICT facilities for technology integration in secondary schools in Delta State in the post Covid-19 era. The finding showed that only few ICT facilities are available. For instance, in all the schools visited, only four ICT gadgets were stated to exist by 50% of the respondents, and all other virtually non-existent. 61.62% of the teachers agreed that they had television, while 38.38% said no television, 74.32% had laptops, and 69.73% had cassette player while 30.27% had none.

On the other hand, only 26% of the teachers said their schools have smartphones 35% had DVD players, 6.89% had scanners and 15% stated they had photocopying machine. The analysis shows that none of the schools visited had the remaining 46 ICT facilities for technology integration in secondary schools in Delta State in the post Covid-19 era. Those non-existent ICT facilities for technology integration in secondary schools included such important facilities as internet facilities, electronic mail, digital cameras, video machines, virtual reality, artificial intelligence (AI), google classroom, electronic boards, learning management systems, etc.

Research Question 2: What development and training programmes that were put in place by the Delta State Government to assist both teachers and students to quickly adopt teaching and learning technologies in the Post-Covid-19 era?

Table 2: Mean rating of the development and training programmes that have been put in place by the Delta State Government to assist both teachers and students to quickly adopt teaching and learning technologies

S/N	Statement	Mean	SD	Remark
1	Training on several instructional strategies	3.83	0.53	High
2	ICT awareness campaign	3.78	0.15	High

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3	Training on how to create engaging and interactive multimedia content and presentations	3.77	0.37	High
4	ICT training workshop	3.73	0.18	High
5	Microsoft office packages	3.51	0.29	High
6	Training on how to use ICT tools to make education more engaging, motivating and innovative	2.95	0.91	Low
7	Digital literacy class	2.34	0.58	Low
8	Training on Web platforms/ICT solution for teachers and students	2.25	0.48	Low
9	Training on distance learning, e-learning and flipped classroom	2.15	0.54	Low
10	Training on how to digitally assess students' knowledge in real-time	2.12	0.52	Low
11	Training on how to create a website or a blog	2.11	0.62	Low
Average Mean		**2.96**	**0.47**	**Low**
Criterion Mean = 3.00				

Table 2 shows the mean rating of the development and training programmes that have been put in place by the Delta State Government to assist both teachers and students to quickly adopt teaching and learning technologies. From the result, the mean score ranged from 2.11 to 3.83 with an average mean of 2.96. The criterion mean used for the assessment is 3.00, which means that only few development and training programmes that were put in place by the Delta State Government to assist both teachers and students to quickly adopt teaching and learning technologies. In fact, the analysis of data showed that the training and development programmes are majorly five and these are ICT awareness campaign, training on several instructional strategies, training on how to create engaging and interactive multimedia content and presentations, ICT training workshop and Microsoft office pages.

Research Question 3: To what extent are teachers willing to accept technology integration in secondary schools in Delta State in the post Covid-19 era?

Table 3: Mean rating of teachers' willingness to accept technology integration in secondary schools in Delta State in the post Covid-19 era

S/N	Statement	Mean	SD	Remark
1	I find technology useful for my teaching	3.47	0.51	High
2	People are always available to assist when difficulties arise with computers	3.43	0.56	High
3	I depend on technology for my work	3.43	0.51	High
4	I use many functions of Learning Management System (e.g., discussion forum, chat session, messaging, download course contents, upload assignments, etc.)	3.42	0.52	High
5	Use of technology in secondary schools will be a good idea	3.42	0.51	High
6	Using the system fits into my teaching styles.	3.41	0.53	High
7	Using the system would make it easier to teach	3.41	0.53	High
8	I have the knowledge to use technology	3.40	0.52	High
9	I use tablets frequently during my work period	3.40	0.52	High
10	Technology makes learning more interesting for the students	3.40	0.49	High
11	I have resources to use computers in my class	3.39	0.54	High

12	Because of the possibilities that technology offers, I am willing to use it	3.38	0.53	High
13	I intend to start using technology in my classes	3.35	0.54	High
14	I intend to use technology on a regular basis	3.33	0.50	High
15	I plan to positively utilize the learning management platform in the future	2.09	0.59	Low
16	I am confident using learning management even with one around me	1.82	0.53	Low
Average Mean		**3.22**	**0.53**	**High**
Criterion Mean = 2.50				

Table 3 shows the mean rating of teachers' willingness to accept technology integration in secondary schools in Delta State in the post Covid-19 era. From the result, the mean score ranged from 1.82 to 3.47 with an average mean of 3.22. The criterion mean used for the assessment is 2.50, which means that teachers are willing to accept technology integration in secondary schools in Delta State in the post Covid-19 era.

Research Question 4: To what extent are secondary school students willing to accept technology integration in secondary schools in Delta State in the post Covid-19 era?

Table 4: Mean rating of students' willingness to accept technology integration in secondary schools in Delta State in the post Covid-19 era

S/N	Statement	Mean	Ranking	SD	Remark
1	For my studies, I would use technology if provided	3.04	1st	0.93	High
2	I will continue to use technology on a regular basis	2.98	2nd	0.99	High
3	I have the knowledge to use technology	2.97	3rd	0.99	High
4	Using the system fits into my study styles.	2.97	4th	0.94	High
5	People are always available to assist when difficulties arise with technology	2.90	5th	0.96	High
6	I have resources to use technology	2.88	6th	0.97	High
7	I find technology useful for studies	2.85	7th	1.03	High
8	Because of the possibilities that technology offers, I am willing to use it	2.78	8th	1.00	High
9	Technology allows me to accomplish class activities more quickly	2.36	9th	1.01	Low
10	Use of technology by the school will be a good idea	2.30	10th	0.94	Low
11	Using the system would make it easier to do my studies	2.29	11th	0.90	Low
12	I plan to positively utilize the Learning Management System platform in the future	2.28	12th	0.93	Low
13	I use technology frequently during my academic period	2.27	13th	0.94	Low
14	I depend on technology	2.27	14th	0.94	Low
15	Technology makes learning more interesting for the students	2.27	15th	0.92	Low
16	I am willing to use the Learning Management System platform in the future.	2.26	16th	0.94	Low
17	Technology increases learning productivity	2.25	17th	0.93	Low

17	Technology increases learning productivity	2.25	17th	0.93	Low
18	I use many functions of Learning Management System (e.g., discussion forum, chat session, messaging, download course contents, upload assignments, etc.)	2.25	18th	0.96	Low
19	I am confident using Learning Management System even with one around me	2.20	19th	0.93	Low
Average Mean		**2.55**		**0.95**	**High**
	Criterion Mean = 2.50				

Table 4 shows the mean rating of students' willingness to accept technology integration in secondary schools in Delta State in the post Covid-19 era. From the result, the mean score ranged from 2.20 to 3.04 with an average mean of 2.55. The criterion mean used for the assessment is 2.50, which means that students are willing to accept technology integration in secondary schools in Delta State in the post Covid-19 era, but this level of acceptance (2.55) is lower than those of teachers (3.33).

Research Question 5: What lessons did the teachers learn from the era of Covid-19?

Table 5: Mean rating of the lessons learnt by teachers from the era of Covid-19

S/N	Statement	Mean	SD	Remark
1	More emphasis be placed on how we prepare our future teachers to use technology in its own right to support, enhance or transform teaching and learning	3.12	0.48	Accepted
2	That we keep solving any digital or technical issues	3.11	0.46	Accepted
3	There should be need to equipe teachers with digital skills to work online	3.10	0.49	Accepted
4	As a result of the Covid-19 pandemic, there is need to give homework online	3.04	0.51	Accepted
5	Teaching has always been a profession where you have got to be resilient	2.75	0.63	Accepted
6	Anything around effective distance learning requires the technological skills and availability of digital technology	2.54	0.72	Accepted
7	The pandemic, while challenging, has given us an opportunity to reset	2.53	0.70	Accepted
Average Mean		**2.88**	**0.57**	**Accepted**
Criterion Mean = 2.50				

Table 5 showed the mean rating of the lessons learnt by teachers from the era of Covid-19. From the result, the mean score ranged from 2.53 to 3.12 with an average mean of 2.88. The criterion mean used for the assessment is 2.50, which means that teachers learnt several lessons from the era of Covid-19.

Hypothesis 1: There is no significant difference in the attitude of teachers and students towards technology integration in Delta State secondary schools in the post Covid-19 era

Table 6: t-test comparison of the attitude of teachers and students towards technology integration in Delta State secondary schools in the post Covid-19 era

Status	***N***	**Mean**	***SD***	***df***	***t***	***p***	**Remark**
Teachers	370	3.38	0.32	751	11.23	0.000	Significant
Students	383	2.97	0.63				

Table 6 shows the result of an independent samples t-test, which was used to compare the attitude of teachers and students towards technology integration in Delta State secondary schools in the post Covid-19 era. The result shows that there is a significant difference in the attitude of teachers and students towards technology integration in Delta State secondary schools in the post Covid-19 era (t [751] = 11.23; $p < 0.05$). Hence, the null hypothesis is rejected. This means that there is a significant difference between the attitude of teachers and students towards technology integration in Delta State secondary schools in the post Covid-19 era, with teachers' positive attitude higher than that of the students.

Hypothesis 2: There is no significant difference between teachers and students' willingness to accept technology integration in Delta State secondary schools in the post Covid-19 era

Table 7: t-test comparison of teachers and students' willingness to accept technology integration in Delta State secondary schools in the post Covid-19 era

Status	***N***	**Mean**	***SD***	***df***	***t***	***p***	**Remark**
Teachers	370	3.22	0.26	751	28.31	0.000	Significant
Students	383	2.55	0.39				

Table 7 shows the result of an independent samples t-test, which was used to compare teachers and students' willingness to accept technology integration in Delta State secondary schools in the post Covid-19 era. The result shows that there is a significant difference in teachers and students' willingness to accept technology integration in Delta State secondary schools in the post Covid-19 era (t [751] = 28.31; $p < 0.05$). Hence, the null hypothesis is rejected. This means that there is a significant difference between teachers and students' willingness to accept technology integration in Delta State secondary schools in the post Covid-19 era.

DISCUSSION

The finding indicates a significant lack of ICT facilities for technology integration in secondary schools in Delta State, especially in the post-COVID-19 era. The available facilities, such as televisions, laptops, cassette players, and CD-ROMs, are insufficient, pointing to a lack of government investment in ICT infrastructure. This shortage is exacerbated by the absence of reliable electricity, internet access, and adequate classroom space, hindering schools from effectively integrating technology into teaching practices. Teacher training is identified as a crucial gap, with many educators in Delta State lacking skills in utilizing web platforms, ICT solutions, e-learning, and flipped classrooms. The absence of training on website creation, blog use, learning management systems, and Google Classroom further hampers the integration of ICT into teaching. Consequently, the existing ICT facilities are underutilized, limiting the potential for schools to enhance teaching and learning through technology.

Several studies, including those by Adomi and Kpangban (2010), Esharenana (2010), and Faturoti (2022), support these findings. They highlight the challenges posed by the lack of ICT facilities, teacher training, and support from school administrators. The COVID-19 pandemic has exacerbated these challenges, making it even more difficult for schools to use ICT for instructional delivery. Reports, such as the one by

UNICEF (2020), further emphasize the dire situation, revealing that only a small percentage of secondary schools in Delta State have access to computers, and a minority of teachers have received adequate training in their effective use. Collectively, these findings and supporting studies underscore the urgent need for increased government investment, infrastructure improvement, and comprehensive teacher training to facilitate the successful integration of ICT in secondary schools in Delta State.

The second finding reveals that the Delta State Government has implemented a limited number of development and training programs aimed at assisting teachers and students in adopting teaching and learning technologies. These programs include training on instructional strategies, ICT awareness campaigns, creating multimedia content, ICT workshops, Microsoft Office packages, and utilizing ICT tools for more engaging education. While the government has taken steps to facilitate the adoption of ICT in schools, the programs are constrained in scope and outreach, and they do not comprehensively address the challenges associated with ICT integration. A significant challenge highlighted is the insufficient emphasis on teacher training. While the government has initiated training programs for teachers, attendance is inconsistent, and the programs often lack practical demonstrations and hands-on practices, partly due to a shortage of appropriate tools. This underscores the need for more comprehensive and practical training to equip teachers with the necessary skills for effective ICT integration in the classroom. Supporting sources, such as a UNICEF report (2020), confirm that the Delta State Government has indeed offered training programs for teachers on ICT use, but attendance and effectiveness remain areas of concern. Adomi and Kpangban's study (2010) suggests that while the government has made investments in ICT infrastructure, more efforts are needed to ensure universal access to essential resources. Esharenana's study (2010) emphasizes the government's promotion of ICT use in schools through awareness campaigns but underscores the need for additional support to enhance ICT utilization in educational settings.

The third finding indicates that teachers in secondary schools in Delta State are receptive to technology integration, especially in the post-COVID-19 era. Teachers demonstrate a willingness to embrace technology in the classroom, recognizing its potential benefits. Several reasons contribute to this openness. Firstly, teachers acknowledge the personal benefits of technology and believe it can be a valuable learning tool. Secondly, they are aware of the growing importance of technology in the workplace and aim to ensure their students are well-prepared for the future. Thirdly, teachers recognize the advantages of technology in enhancing their own teaching practices, including creating engaging lessons, providing differentiated instruction, and assessing student learning.

The COVID-19 pandemic has played a significant role in fostering this willingness among teachers. The sudden shift to online instruction during the pandemic provided teachers with firsthand experience of the potential benefits of using technology in the classroom. As a result, teachers are now more inclined to accept technology integration, acknowledging its value as a tool for learning and expressing eagerness to leverage it for improving teaching practices. This finding aligns with earlier studies, such as Faturoti (2022), which observed increased teacher willingness to embrace technology integration post-COVID-19. Other studies, including those by Obi (2020), Ogunleye (2019), and Adewole et al. (2018), also support the notion that teachers are more willing than students to accept technology integration in the classroom and are more likely to incorporate ICT into their teaching practices.

The fourth finding highlights a significant difference in the attitudes of teachers and students toward technology integration in Delta State secondary schools in the post-COVID-19 era. Teachers exhibit a more positive attitude than students, indicating openness from both groups toward the use of technology in the classroom. This positive finding suggests that both teachers and students recognize the potential benefits of technology integration. The teachers' more favorable attitude is attributed to factors such as their likely training in using technology in the classroom, awareness of the benefits of technology for enhancing learning, and motivation to improve their teaching practices through technology. This finding aligns with several other studies, including Faturoti (2022), Obi and Oyelade (2020), Ogunleye and Ogunsanwo (2019),

and Adewole et al. (2018). These studies collectively indicate a positive attitude toward the use of ICT in education among both teachers and students in Delta State, with teachers generally expressing a more positive outlook. It's important to note that these studies were conducted during the COVID-19 lockdown, and while they suggest a general acceptance of technology in education, attitudes may have evolved since then.

The fifth finding reveals that students in secondary schools in Delta State are willing to accept technology integration in the post-COVID-19 era. This implies that students are open to the use of technology in the classroom and recognize the potential benefits of this approach. Several reasons contribute to students' willingness to embrace technology integration. Firstly, many students are familiar with using technology in their daily lives and understand its benefits for learning. Secondly, students are cognizant of the increasing importance of technology in the workplace, motivating them to be prepared for the future. Thirdly, students acknowledge the advantages of technology in enhancing their own learning, including creating engaging lessons, providing differentiated instruction, and assessing student learning.

The COVID-19 pandemic has played a significant role in shaping students' openness to technology integration. The shift to online learning during the pandemic exposed students to digital educational resources, providing them with firsthand experience of the potential benefits of technology in the classroom. As a result, many students are now more willing to accept technology integration, recognizing it as a valuable tool for learning and expressing eagerness to use it to improve their own learning. This finding is consistent with several studies, including Faturoti (2022), Obi and Oyelade (2020), and Ogunleye and Ogunsanwo (2019), which observed increased student willingness to accept technology integration post-COVID-19. Additionally, reports such as the one by UNICEF (2020) support the notion that a majority of students in Nigeria believe technology can enhance their learning experience.

The additional finding reveals that teachers in Delta State have derived several lessons from the era of COVID-19. These lessons include the importance of preparing future teachers to use technology effectively, addressing digital or technical issues, equipping teachers with digital skills for online work, incorporating online homework, recognizing the resilience required in teaching, and understanding that effective distance learning necessitates technological skills and access to digital technology. The finding implies that one of the most significant lessons is the recognition of the crucial role of technology in education. The pandemic compelled teachers to use technology for instruction, assessment, and communication, highlighting its potential as a powerful learning tool. Teachers have also learned the importance of flexibility and adaptability in response to the constantly changing environment created by the pandemic. These lessons are deemed valuable for teachers not only in Delta State but globally, shaping the future of education.

This finding aligns with previous studies. For example, Wiley et al. (2021) discuss how the COVID-19 pandemic emphasized the importance of technology in learning and the need for teachers to acquire effective digital skills. They also stress the significance of flexibility and adaptability in teaching practices. Similarly, Emily et al. (2021) explore the impact of the pandemic on teacher practices, noting the necessity for adapting to new methods, including increased use of technology and individualized instruction. Kennedy-Moore and McGeown (2021) discuss lessons from the pandemic, emphasizing the importance of social-emotional learning, flexible instruction, and collaboration among teachers. These studies collectively highlight the transformative potential of the lessons learned from the pandemic for the future of education.

The finding indicates that both teachers and students in Delta State secondary schools are willing to accept technology integration in the post-COVID-19 era. However, a corresponding hypothesis suggests a significant difference between the willingness of teachers and students to embrace technology integration, with teachers demonstrating a higher level of willingness. This implies that both groups are open to using technology in the classroom and recognize its potential benefits, but there may be variations in how they perceive the role of technology in education. For instance, teachers might view technology as a means to

enhance the quality of education, while students might see it as a way to make learning more enjoyable and engaging.

This finding aligns with previous studies, such as the one conducted by Faturoti (2022), which observed a positive attitude toward technology use among both teachers and students in Delta State. While teachers were more likely to use technology in their teaching, students also showed openness to incorporating technology into their learning. Another study by Obi and Oyelade (2020) found a significant difference in the perceptions of teachers and students regarding technology integration. Teachers tended to emphasize the potential improvement in the quality of education through technology, whereas students were more inclined to see technology as a tool for enhancing the enjoyment and engagement in education.

CONCLUSION AND RECOMMENDATIONS

In view of the findings, it was concluded that despite the limited availability of ICT facilities and development and training programmes, both teachers and students in Delta State secondary schools in the post-COVID-19 era have a positive attitude towards technology integration. Both teachers and students in Delta State are willing to accept technology integration in their schools. Based on the above finding, the researcher recommended the following:

1. The Delta State Government should increase the availability of ICT facilities and development and training programmes in secondary schools.
2. Schools should provide teachers with ongoing training on how to use technology effectively in the classroom.
3. Schools should create a culture of innovation and collaboration in order to facilitate the use of technology in learning.
4. Government should promote the use of ICT in schools through awareness campaigns and other initiatives.
5. There is a need to provide more training and support to students so that they can become more comfortable with using technology in the classroom.
6. Make sure that the use of technology is integrated into the curriculum in a meaningful way.
7. Provide students with access to a variety of technology tools or educational digital facilities.

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